

ACCESSION NR: AT4040415

was investigated at various distances from the zone of minimum temperature in the direction of increasing temperature. Analysis of the photomicrographs obtained showed that an increase in ultrasonic heating temperature is accompanied by an increase in pitting along the original grain boundaries after etching. This pitting, which is not observed after electrical heating, is explained by internal friction caused by defects at the grain boundaries. The relaxation spheres detected by ultrasonic heating do not overlap, and relaxation proceeds in each sphere independently. In the zone of heating above 910C, boundaries of new grains appear indicating the absence of relaxation processes and the small accumulation of elements causing chemical non-homogeneity between the boundaries and the grains at these places. In the zone of higher temperature, etching pits along the original grain boundaries become less pronounced, and new grains become coarser and more distinct. In the zone close to the site of specimen failure, only remainders of the original grain boundaries are present, and new grain boundaries show signs of grain loosening. In the zone immediately adjacent to the site of failure, crack formation is observed; failure of the specimen takes place along new grain boundaries formed in the process of grain transformation. The authors conclude that traces of the original imperfect grain boundaries remain after transformation, but gradually disappear with a further increase in temperature. Orig. art. has: 6 photomicrographs.

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ACCESSION NR: AT4040415

ASSOCIATION: none

SUBMITTED: 09Dec63

DATE ACQ: 28May64

ENCL: 00

SUB CODE: MM

NO REF SOV: 003

OTHER: 001

Card 3/3

ACCESSION NR: AT4040416

S/0000/64/000/000/0117/0132

AUTHOR: Bokshetyn, S. Z.; Yemel'yanova, T. A.; Kishkin, S. T.; Mirskiy, L. M.

TITLE: Structural characteristics and diffusion mobility in titanium alloys in various phase states

SOURCE: Protsessy* diffuzii, struktura i svoystva metallov (Diffusion processes, structure and properties of metals); sbornik statey. Moscow, Izd-vo Mashinostroyeniye, 1964, 117-132

TOPIC TAGS: titanium, titanium alloy, titanium manganese alloy, alloy VT3-1, alloy VT15, diffusion mobility, carbon diffusion, nickel diffusion, molybdenum diffusion, alloy structure, martensite

ABSTRACT: Previous investigations have indicated that, during autodiffusion and diffusion of various elements in metal alloys, displacements of the atoms occur mainly along the grain boundaries. However, during diffusion of iron, chromium, and tin in titanium under certain conditions, a predominantly intragranular and non-uniform diffusion has been observed. In this connection, the authors experimented with titanium alloys VT3-1, VT15 and Ti + 3.83% Mn the structural characteristics occurring during B-d

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transformation, as well as to compare the diffusional permeability of titanium-base alloys in various phase states. The results of radiographic and microscopic studies showed that in the process of β - α transformation according to martensitic kinetics, substantial disruption of the crystalline structure occurs at the α' limit, producing changes which remain stable on subsequent heating and provide ways of increasing the diffusional mobility. A study of the distribution of carbon and nickel in the alloys led to the following conclusions: a) during diffusion in the β region of titanium-manganese alloys, carbon is distributing uniformly along the grain boundaries without perceptible segregation; b) during continuous cooling of this alloy from the β region, a rapid displacement of carbon atoms occurs toward the α' limit; c) after isothermal transformation of the β phase and formation of equiaxial α plus retained β , a uniform intragranular distribution of carbon takes place, whereby carbon diffuses preferably into the α phase; d) during diffusion of nickel into the α phase of the VT3-1 alloy, concentrations of atoms occur on the boundaries of the acicular formations of this phase. Only after prolonged annealing at a subcritical temperature, when the polyhedral α phase is formed, does diffusion proceed preferably along the grain boundaries. However, even in this case, some non-uniform intragranular diffusion still takes place. A comparison of the diffusional permeability in titanium-base alloys in various phase states led to the conclusion that: a) the mobility of molybdenum during diffusion in the β phase of VT 15 alloy is lower than during diffusion in the heterophasic

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region of this alloy; b) the diffusional permeability of the equiaxial α phase in VT3-1 alloy is lower than the diffusional permeability of the acicular α phase. Recrystallization of the α phase in VT3-1 alloy thus leads to an increase in the diffusional mobility of the atoms. Orig. art. has: 10 figures and 2 tables.

ASSOCIATION: None

SUBMITTED: 09Dec63

DATE ACQ: 28May64

ENCL: 00

SUB CODE: MM

NO REF SOV: 005

OTHER: 001

Card

3/3

ACCESSION NR: AT4040417

S/0000/64/000/000/0133/0146

AUTHOR: Blistanov, A. A.; Bokshteyn, S. Z.; Gudkova, T. I.; Kishkin, S. T.; Zhukhovitskiy, A. A.

TITLE: Pore formation and rupture at high temperatures in relation to stress and metal structure

SOURCE: Protsessy* diffuzii, struktura i svoystva metallov (Diffusion processes, structure and properties of metals); sbornik statey. Moscow, Izd-vo Mashinostroyeniye, 1964, 133-146

TOPIC TAGS: alpha brass, nichrome, nickel based alloy, alloy pore formation, volatile constituent diffusion, grain boundary effect, stress effect, metal structure effect, high temperature failure, metal failure analysis

ABSTRACT: This study concerned the kinetics of pore formation, as well as the effects of stress, temperature and structure of the metal on such processes in relation to failure of the metal at high temperatures. Sheet samples of alpha brass (32% Zn and 68% Cu; annealed 50 hrs. at 800C and 0.01 mm Hg) and a Nichrome alloy (20% Cr, 80% Ni; prehomogenized

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50 hrs. at 1200C in argon) were polished electrolytically, then homogenized in a vacuum (residual pressure 0.001 mm Hg, temp. 500 - 1250C, volatile component distillation) under stresses varying from 15 to 120 kg/cm² or unstressed. Results obtained with the brass samples indicate that pore formation is initiated due to evaporation and the accompanying diffusive migration of constituents. The effect of grain boundaries is not apparent in the initial stages, but becomes clearly pronounced as the process continues. Pores form earlier as temperature rises. The presence of stress accelerates the process and the effect of grain boundaries rises sharply. The process is completed by cracking and rupture along the grain boundaries. Pore formation was absent in unstressed nichrome, while stressed samples showed significant porosity, cracks and eventual failure, mainly along the grain boundaries. Other experiments indicate that heterogeneity of the material significantly affects patterns of pore distribution. It is concluded that similar studies will permit physical analysis of metal failure at high temperatures. Orig. art. has: 4 graphs and 8 photomicrographs.

ASSOCIATION: none

SUBMITTED: 09Dec63

SUB CODE: MM

Card 2/2

DATE ACQ: 28May64

NO REF SOV: 003

ENCL: 00

OTHER: 003

ACCESSION NR: AT4040418

S/0000/64/000/000/0147/0151

AUTHOR: Bokshteyn, S. Z.; Gudkova, T. I.; Zhukhovitskiy, A. A.; Kishkin, S. T.

TITLE: Effect of preliminary deformation on pore formation

SOURCE: Protsessy* diffuzii, struktura i svoystva metallov (Diffusion processes, structure and properties of metals); sbornik statey. Moscow, Izd-va Mashinostroyeniye, 1964, 147-151

TOPIC TAGS: alpha brass, pore formation, preliminary deformation effect, high temperature effect, metal evaporation, alloy failure

ABSTRACT: Cylindrical samples ($h = 10$ mm) of alpha brass (38% Zn, 62% Cu) were annealed for 3 hrs. at 800C in an argon atmosphere, then pressed at room temperature to deformation levels of 3-5%, 15-20% and 55-60%. The effect of preliminary deformation on evaporation was evaluated from changes in sample weight during subsequent vacuum homogenizing (4 hrs. at 700, 800 or 850C). It was found that preliminary plastic deformation increased the rate of evaporation, as well as the number and size of pores forming at high temperatures. The effect was most pronounced at deformation levels of 10% or less and

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decreased at higher levels or as temperature increased. Orig. art. has: 4 graphs.

ASSOCIATION: none

SUBMITTED: 09Dec63

DATE ACQ: 28May64

ENCL: 00

SUB CODE: MM

NO REF SOV: 000

OTHER: 000

Card 2/2

ACCESSION NR: AT4040419

S/0000/64/000/000/0155/0167

AUTHOR: Bokshteyn, S. Z.; Kishkin, S. T.; Svetlov, I. L.

TITLE: A study of the mechanical properties of Cu, Ni and Co whiskers

SOURCE: Protsessy* diffuzii, struktura i svoystva metallov (Diffusion processes, structure and properties of metals); sbornik statey. Moscow, Izd-vo Mashinostroyeniye, 1964, 155-167

TOPIC TAGS: copper whisker crystal, nickel whisker crystal, cobalt whisker crystal, whisker tensile strength, whisker structural defect, whisker alloying effect, whisker diameter effect, whisker microcrystalline dislocation, selective etching procedure

ABSTRACT: Whiskers of Cu, Ni and Co (length = 1.5-3 mm, diameter = 2-15 μ), grown by hydrogen reduction of anhydrous haloid salts, were tested for tensile strength in relation to crystal diameter and orientation of its long axis, as well as for variation in strength lengthwise and the effect of alloying (diffusive saturation of Cu with Ag) on mechanical properties. Selective etching was used to expose microcrystalline dislocations in the Cu. The results indicate substantial divergence in relation to diameter, especially for very small diameters of 2 - 3 μ . Empirical relationships were derived between diameter and tensile strength,

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given by $\frac{308}{d} + 16.8$ for Cu, $\frac{620}{d} + 23$ for Ni and $\frac{1200}{d} - 45$ for Co. Orientation was not a significant factor. Strength of a whisker cut in half varied from 10 kg/mm² for one of the halves to 163 kg/mm² for the other, demonstrating the statistical distribution of defects along its length. Alloying improved strength for larger diameters (6 μ or greater) and reduced it for smaller diameters. The etching procedure involved Joung's technique, (10 sec., 2M FeCl₃·6H₂O, 7.8M HBr) and the preliminary results indicate the presence of a spiral dislocation along the growth axis. Orig. art. has: 11 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 09Dec63

DATE ACQ: 28May64

ENCL: 00

SUB CODE: MM

NO REF SOV: 005

OTHER: 004

Card 2/2

ACCESSION NR: AT4040420

S/0000/64/000/000/0168/0176

AUTHOR: Bokshteyn, S. Z.; Nazarova, M. P.; Svetlov, I. L.

TITLE: Growing of sapphire fiber crystals

SOURCE: Protsessy* diffuzii, struktura i svoystva metallov (Diffusion processes, structure and properties of metals); sbornik statey. Moscow, Izd-vo Mashinostroyeniye, 1964, 168-176

TOPIC TAGS: aluminum oxide crystal, aluminum oxide whisker, aluminum oxide, whisker growth, whisker

ABSTRACT: Equipment and techniques for growing sapphire whiskers are described. The equipment consists of a tubular electric furnace with an alundum tube and a hydrogen supply source with purification and feed systems. The initial charge, aluminum powder mixed with 3-6% aluminum oxide, is placed in cotundum boats and held for 1-2 hr at 1360-1390C at atmospheric pressure in a current of purified hydrogen containing water vapor at a partial pressure of 10^{-3} atm. The boat, with reaction products, is then cooled to 500C in a current of hydrogen. There are three distinct zones along the boat length.

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ACCESSION NR: AT4040420

In the first zone, facing the hydrogen current, relatively large microcrystals grow, mostly in the form of elongated plates, needles, or tetragonal prisms. The longer the boat, the greater the number of such microcrystals. The whiskers grow in the next zone, on the bottom and sides of the boat. They are 10—15 mm long with a diameter between 1 and 15 μ . Most of them have a smooth shiny surface. The rest of the boat is filled with a loose, fluffy deposit topped with a multitude of very fine, short fibers. Whiskers grown in porcelain boats have many branches and a rough surface. Whiskers were also found on the walls of the alundum tube, which proves that the whiskers grow from the vapor phase. As proved earlier, the growth proceeds by the mechanism of screw dislocation. Orig. art. has: 7 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 09Dec63

DATE ACQ: 28May64

ENCL: 00

SUB CODE: SS

NO REF SOV: 000

OTHER: 007

Card 2/2

ACCESSION NR: AT4040421

S/000/64/000/000/0177/0182

AUTHOR: Bokshiteyn, S. Z.; Glazunov, S. G.; Yemel'yanova, T. A.;
Kabanov, Yu. N.; Kishkin, S. T.; Mirskiy, L. M.

TITLE: Thermomechanical treatment of titanium alloys with β -structure

SOURCE: Protsessy* diffuzii, struktura i svoystva metallov (Diffusion processes, structure, and properties of metals); sbornik statey. Moscow, Izd-vo Mashinostroyeniye, 1964, 177-182

TOPIC TAGS: titanium alloy, beta structure, mechanical property, thermomechanical treatment, thermomechanical treatment effect

ABSTRACT: The effect of thermomechanical treatment on the mechanical properties of β -titanium alloys VT15 (3.76% Al, 7.80 Mo, 10.7% Cr) and V-120 (US alloy, 3.1% Al, 11.6% Cr, 12.6% V) were investigated. Alloy specimens were held at 760C for 30 minutes, then rolled with a reduction of either 10 or 45% and immediately quenched (high temperature thermomechanical treatment, HTTMT) or they were cooled at 350C, held for 2-3 minutes, rolled with a reduction of 10 or 40%, and

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ACCESSION NR: AT4040421

immediately quenched. In both cases, quenching was followed by aging at 450C for 25 or 50 hr. The mechanical properties of differently treated alloys are shown in Table 1 of the Enclosure. In stress rupture tests [apparently at 400C] under a stress of 100 kg/mm², the VT15 alloy had a rupture life of 13.5—15.0 hr, elongation of 17.2—19.0%, and a reduction of area of 49.0—51.5% after HTMT. The V-120 alloy similarly treated had a rupture life of 97—100 hr. Orig. art. has: 5 figures and 4 tables.

ASSOCIATION: none

SUBMITTED: 09Dec63

ATD PRESS: 3049

ENCL: 01

SUB CODE: MM

NO REF SOV: 000

OTHER: 001

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ACCESSION NR: AT4040421

ENCLOSURE: 01

Table 1. Mechanical properties of VT15 titanium alloy

Treatment	Reduction Z	Aging, Hrs	Test Temperature, C	Tensile Strength Kg/mm ²	Yield Strength, Kg/mm ²	Elongation, %	Reduction of Area Z	Notch Toughness, Mkg/cm ^{3/2}
HTMT	10	25	20	153	146	3.0	11.3	1.7
	10	25	400	127	-	5.2	31.5	-
	10	50	20	147	141	2.6	7.6	1.2
	10	50	400	117	-	5.0	31.5	-
	45	25	20	159	155	3.0	10.6	1.1
	45	25	400	123	-	6.0	38.2	-
	45	50	20	152	149	4.2	12.1	1.3
	45	50	400	-	-	-	-	-
LTMT	45	25	20	100	133	3.1	23.0	1.0
	45	25	400	124.5	-	3.5	21.2	-
	45	50	20	154	148	2.9	11.0	1.1
	45	50	400	122	-	4.0	23.8	-
Annealing at 760C, water quenched	-	25	20	126	123	7.8	31.2	-
	-	25	400	118	-	6.0	28.0	-
	-	50	20	134	128	6.2	18.7	-
	-	50	400	122	-	6.0	35.0	-

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ACCESSION NR: AT4040422

S/0000/64/000/000/0183/0187

AUTHOR: Bokshteyn, S. Z.; Kishkin, S. T.; Moroz, L. M.

TITLE: Effect of thermomechanical treatment on diffusion mobility

SOURCE: Protsessy* diffuzii, struktura i svoystva metallov
(Diffusion processes, structure and properties of metals); sbornik
statey. Moscow, Izd-vo Mashinostroyeniye, 1964, 183-187

TOPIC TAGS: thermomechanical treatment, diffusion mobility,
diffusion coefficient, fine structure, diffusion mobility determina-
tion, thermomechanical treatment effect

ABSTRACT: The diffusion mobility of iron in austenitic steel EI481
and EI437B alloy were investigated after conventional heat treatment
and after thermomechanical treatment (TMT). The parameters of the
latter treatment were: 1080C - temperature of deformation; 28% -
reduction; and 13.5 m/min - deformation rate. The diffusion mobility
was determined by the method of tagged atoms in combination with
microstructure analysis. The specimens were electrolytically coated

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ACCESSION NR: AT4040422

with a thin film of radioactive Fe^{59} and annealed in a vacuum furnace at 800C for 150 hr. After annealing, the diffusion coefficients were calculated for grain volume and grain boundaries. Table 1 (see enclosure) presents the results obtained. Thus, TMT changes not only the conditions of the grain boundaries but of the grain bodies as well. The increase of diffusion mobility is preserved even after annealing at higher temperatures (temperature of recrystallization). The increase of diffusion mobility produced by TMT limits the applicability of this method for heat-resistant alloys. TMT could be beneficial, however, for alloy working at relatively low temperature. Orig. art. has: 4 figures and 2 tables.

ASSOCIATION: none

SUBMITTED: 09Dec63

ATD PRESS: 3072

ENCL: 01

SUB CODE: MM

NO REF SOV: 001

OTHER: 00

Card 2/3

ACCESSION NR: AT4040422

ENCLOSURE: 01

Table 1. Iron diffusion coefficients
D•10 cm /sec on grain boundaries Dgr
and in grain bodies Db of alloys EI437B
and EI481 at 800C

Alloy	Conventional heat treatment		TMT	
	Dgr	Db	Dgr	Db
EI481	0.62	4.6	2.8	—
EI437B	0.87	3.5	1.7	11
Average diffusion coefficient				
EI481	1.4		3.0	
EI437B	1.0		1.3	

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BOKSHTEYN, S.Z.; KISHKIN, S.T.; NAZAROVA, M.P.; SVETLOV, I.L.; UMANTSEV, E.L.

Growth of sapphire whiskers. Fiz. tver. tela 6 no.5:1261-1266
My '64. (MIRA 17:9)

L 56052-65 EWT(m)/EWA(d)/PR/T/EWP(t)/EWP(z)/EWP(b)/EWA(c) Ps-4 IJP(c)
 ACCESSION NR: AP5010555 MJW/JD/JW UR/0129/65/009/004/0036/0038
 532.72:669.71'72

31
30
B

AUTHOR: Bokshteyn, S. Z.; Bronfin, M. B.; Kishkin, S. T.; Marichev, V. A.

TITLE: Study of the diffusion of magnesium in aluminum by means of evaporation
 in a vacuum 16 27 27

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 4, 1965, 36-38

TOPIC TAGS: magnesium diffusion, aluminum alloy, vacuum evaporation, magnesium containing alloy

ABSTRACT: The diffusion of magnesium in aluminum was studied at 275-425C by evaporation from an open surface. Samples of the Al-Mg alloy AMg6 containing 6.35% Mg were used. As time elapses, the surface layers of the sample become depleted of Mg; a concentration gradient is thus created which causes the migration of magnesium by diffusion from the middle layers to the surface. Subsequently, Mg evaporates at the rate at which it is supplied by this diffusion. The evaporation was determined from the weight loss of the sample, and kinetic curves of the specific weight loss under isothermal conditions were plotted for several temperatures. From these curves, the coefficients of diffusion of magnesium in

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ACCESSION NR: AP5010555

aluminum were calculated for 275, 300, 350, 375, 400, and 425C by assuming that the diffusion coefficient is independent of the Mg concentration, which is zero at the surface of the sample in the course of the isothermal process. The activation energy of the diffusion of Mg in Al was obtained graphically, and found to be 28.50 kcal/g·at. Orig. art. has: 2 figures, 1 table, and 2 formulas.

ASSOCIATION: None

SUBMITTED: 00

ENCL: 00

SUB CODE: MM, SS

NO REF SOV: 001

OTHER: 003

Card

SR
2/2

BOGSHTEYN, S.Z. (Moscow); KISHKON, S.T. (Moscow); MURKIN, S.M. (Moscow);
TAVAEZE, F.B. (Moscow); KNERUDENASHVILI, Z.G. (Moscow).

Diffusive mobility and heat resistance of lithium at
following thermal and thermomechanical treatments. Izv. AN
SSSR. No. 10, no. 5, 139-144, 1968.

(MIRA 18:10)

BOKSHTEYN, S.Z., doktor tekhn. nauk, prof., red.; TRUSOVA, Ye.F.,
kand. tekhn. nauk, red.; KUNYAYEVSKAYA, T.N., red.

[Phase constitution, structure and properties of addition
alloy steels and alloys] Fazovyi sostav, struktura i svoi-
stva legirovannykh stalei i splavov. Moskva, Mashino-
stroenie, 1965. 231 p. (MIRA 18:4)

L 62818-65

EWI(m)/T/EWP(t)/EWP(z)/EWP(b)/EWA(c) Pad IJP(c) JD/151

ACCESSION NR: AP5018049

UR/0129/65/000/007/0008/0010
66.071.6:620.19

AUTHOR: Bokshteyn, S. Z.

TITLE: Structural defects and diffusion

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 7, 1965, 8-10,
and insert facing p. 24

TOPIC TAGS: lattice defect, crystalline diffusion, metal diffusion, metal whisker,
nickel diffusion

ABSTRACT: This is a brief survey of the current knowledge concerning the relation between structural defects and the rate of diffusion (however, no complete reference list is given). The author emphasizes that it has been shown experimentally that strong diffusion flows exist in the vicinity of lattice defects. It was also found lately that a strong diffusion exists along the phase boundaries. A brief discussion of the changes in the Ni self-diffusion coefficient as a function of depth inside a polished Ni alloy is followed by a brief mention of the semiempirical diffusion model by G. Love (Acta Metalurgica, 1964, v. 12, no. 6), and the presentation of some data from a recent study of diffusion in defectless crystal whiskers. The diffusion coefficient within 5 μ whiskers is only slightly smaller than in ordinary monocrystals; the diffusion activation energy, however, is substantially smaller:

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I 62818-65

ACCESSION NR: AP5018049

12,500 versus 45,000 cal/g·atm). Orig. art. has: 5 figures.

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: MM, SS

NO REF SOV: 002

OTHER: 001

Card 2/2

I 11202-66 EWT(m)/EWP(t)/EWP(s)/EWP(b)/EWA(s) LTP(a) SD/HN
 ACC NR: AP5026361 SOURCE CODE: UR/0370/65/000/005/0139/0142
 AUTHOR: Bokshetyn, S. Z. (Moscow); Kishkin, S. T. (Moscow); Mirskiy, L. N. (Moscow);
Tavadze, F. N. (Moscow); Kherodinashvili, Z. Sh. (Moscow)
 ORG: none
 TITLE: Diffusivity and heat resistance of titanium alloys after thermal and thermo-
 mechanical working
 SOURCE: AN SSSR. Izvestiya. Metally, no. 5, 1965, 139-142
 TOPIC TAGS: titanium alloy, carbon alloy, solid mechanical property, metal aging,
 metalworking, metal diffusion, metal heat treatment, metal forming, thermal aging.
 ABSTRACT: The effect of standard thermal and thermomechanical working of VTZ-1 ti-
 tanium alloy on carbon diffusivity in alloys and alloy strength was investigated. The
 standard thermal treatment consisted of heating to 870°C, followed by soaking at
 870°C for 1 hour, cooling to 650°C and soaking at 650°C for one hour and air cooling
 to room temperature. Thermomechanical working consisted of deformation of 30 x 30 x
 x 65 mm alloy samples at 870°C (60% deformation per hammer strike) and instantaneous
 quenching in water. This was followed by aging for 5 hours at 550°C. For short and
 long lasting mechanical strength tests, thermally and thermomechanically worked alloy
 samples were reduced to 5 mm in diameter. Carbon diffusivity tests were made on
 10 x 10 x 20 mm alloy samples. Orig. art. has: 2 figures.
 Cord 1/3 *Probably BT3-1, 4 UDC: 669.295.5-157.9

L 11202-66

ACC NR: AP5026351

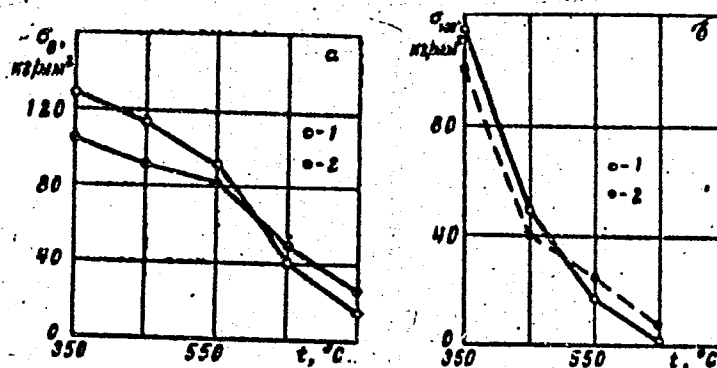


Fig. 1. Effect of temperature on short-lasting strength σ_B and 100-hour linear strength σ_{100} of VTZ-1* alloys after thermomechanical working, (1); After standard thermal working (2).

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L 11202-66

ACC NR: AP5026361

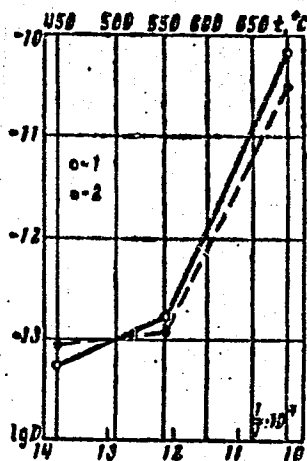


Fig. 2. Temperature dependence of the logarithm of the diffusion coefficient in * VTZ-1 alloy after thermomechanical working (1); after standard thermal working (2).

SUB CODE: 11/

SUBM DATE: 06May65/

ORIG REF: 005/

OTH REF: 000

Card 3/3

L 22543-66 EWT(1)/EWT(m)/T/EWP(t) IJP(c) JD/GG
ACC NR: AP6009644

SOURCE CODE: UR/0181/66/008/003/0688/0695

AUTHOR: Bokshteyn, S. Z.; Kishkin, S. T.; Svetlov, I. L.

ORG: none

TITLE: Influence of orientation, dimension, state of surface, and alloying of
filamentary crystals of copper on the form of the deformation diagram in uniaxial
tension

SOURCE: Fizika tverdogo tela, v. 8, no. 3, 1966, 688-695

TOPIC TAGS: copper, fiber crystal, stress analysis, plastic deformation, single
crystal

ABSTRACT: In view of the fact that no previous tension strain diagrams of fila-
mentary crystals have been made in the past, the authors measured the tension
strain diagrams of copper whiskers whose growth direction coincided with the
angles of the standard stereographic triangle. The peculiarities of the stress-
strain curves of thick whiskers, samples with a silver-surface film, and alloyed
whiskers were also investigated. The experimental procedure and the technique of
obtaining the strain diagrams was described in detail by the authors earlier (FTT
v. 7, 3348, 1965). The dependence of each parameter of the diagram (elastic limit,
plastic-flow stress, ultimate strength, hardened coefficients in the linear stage,

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L 22543-66

ACC NR: AP6009644

and duration of the easy slip stage) on the orientation of the whisker relative to the direction of the tensile stress is analyzed separately. The stress-strain curves of ordinary and filamentary single crystals are compared, and it is shown that thin whiskers always display a sharp elastic limit, whose magnitude is 50--300 times higher than the critical cleavage stress. An increase in the density of the structural defects, such as results from alloying, reduces the elastic limit. Another distinguishing feature of the stress-strain curves of whiskers is that even the easy-slip stress exceeds by 10--15 times the torsional stress. No theoretical explanation exists for this latter effect. The interpretation of the test results is made difficult by the lack of precise knowledge of the mechanisms occurring during the three different stages of the stress-strain variation for whiskers (elastic, easy slip, and hardening stages). Orig. art. has: 6 figures, 1 formula, and 3 tables.

SUB CODE: 20/

SUBM DATE: 12Jul65/

ORIG REF: 004/

OTH REF: 005

Card 2/2

BK

L 23718-66 EWT(m)/ENA(d)/EWP(t) IJP(c) JD/WB

ACC NR: AP6013374

SOURCE CODE: UR/0370/66/000/002/0177/0187

AUTHOR: Bokshetyn, S. Z. (Moscow); Bronfin, M. B. (Moscow); Zhukhovitskiy, A. A. (Moscow); Kishkin, S. T. (Moscow); Marichev, V. A. (Moscow)

ORG: none

TITLE: Characteristics of metal sublimation in the presence of an oxidized surface layer

SOURCE: AN SSSR. Izvestiya. Metally, no. 2, 1966, 177-187

TOPIC TAGS: sublimation, vacuum sublimation, magnesium alloy, aluminum alloy, alloy sublimation/VM65-1 alloy, V95 alloy

ABSTRACT: Theoretical and experimental studies have been made of the sublimation and mechanism of the breakdown in the presence of an oxidized surface layer of VM65-1 magnesium-base alloy (5-6% Zn, 0.3-0.9% Zr) and V95 aluminum-base alloy (2.5% Mg and 6% Zn) in a vacuum of 10^{-8} torr at a temperature of 200-380C. It was found that magnesium alloy with a surface oxide film sublimated slowly at 200 or 250C for the first 12-15 hr; then the sublimation rate increased sharply. Specimens which were vacuum annealed at 300C for 4 hr prior to testing sublimated at a high rate from the very beginning of the test (see Fig. 1). The weight of surface-oxidized V95 alloy specimens does not change at 300C for 4 hr. However, at 350C rapid sublimation begins after 10-15 min. Annealing at 340C removes the oxide film, eliminates the inoculation period, and induces rapid sublimation (as in the

Card 1/2

UDC: 669.049.6

L 23718-66

ACC NR: AP6013374

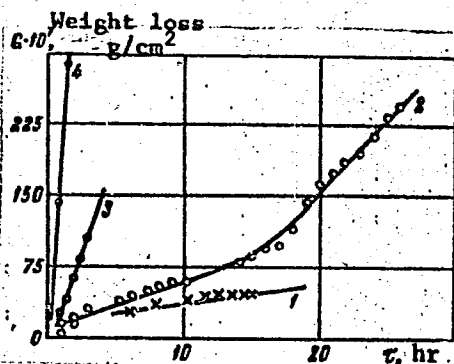


Fig. 1. Sublimation curves of VM65 alloy in vacuum

1 - 200C; 2 - 250C; 3 - 200C;
4 - 250C (3 and 4 after annealing
at 300C for 4 hr).

case of VM65 alloy) at the very beginning of the test. The experimental values of the sublimation rate agree well with values obtained from kinetic equations for the sublimation process of tested alloys. Orig. art. has: 7 figures and 26 formulas.
[AZ]

SUB CODE: 11, 13/ SUBM DATE: 18Feb65/ ORIG REF: 004/ OTH REF: 004/ ATD PRESS:

4247

Card 2/2 *fw*

L 29800-66 EWT(1)/EWT(m)/EEC(k)-2/T/EWP(t)/ETI/EWP(k) IJP(c) WG/JD/GS
 ACC NR: AT6016344 (N) SOURCE CODE: UR/0000/65/000/000/0022/0029

AUTHORS: Bokshteyn, S. Z.; Bokshteyn, B. S.; Zhukhovitskiy, A. A.; Kishkin, S. T.;
Nechayev, Yu. S.

ORG: none

TITLE: Relaxation method for the study of point defects in the crystal lattice of
 metals ² ₁₄ 63 8+1

SOURCE: AN UkrSSR. Podvizhnost' atomov v kristallicheskey roshetke (Mobility of
 atoms in crystal lattice). Kiev, Izd-vo Naukova dumka, 1965, 22-29

TOPIC TAGS: metal crystal, crystal lattice, ~~lattice defect~~, crystal lattice defect,
~~electric resistance~~ *electric resistance*

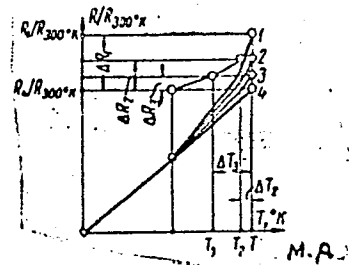
ABSTRACT: A relaxation method for the study of point defects in metal crystal
 lattices is presented. The proposed method is particularly suited for the separate
 determination of the activation energies of vacancy formation Q_f , and vacancy
 mobility Q_m in metal crystal lattices. The method is based on the determination of
 the vacancy relaxation time as a function of the temperature

Card 1/3

29800-66

ACC NR: AT6016344

Fig. 1. Temperature dependence of the electrical resistance of metals for different rates of heating. 1 - lattice with equilibrium vacancies concentration, small heating rate; 4 - lattice without vacancies, large heating rate; 2, 3 - intermediate curves.



and Q_m from $\tau = A \exp(Q_m/RT)$. The value of Q_r is derived from a graph of $\ln \frac{\Delta R}{R}$ vs $\frac{1}{T}$. The method was tested on aluminum specimens, and a schematic of the experimental installation is presented. It was found that the relaxation time for Al at the melting point was 1.9×10^{-2} sec and $Q_r = 17 \pm 4$ kcal/mole. A variation of the above method affords a study of the kinetics for the reestablishment of equilibrium vacancies concentrations. This method is based on the determination of the change in the electrical resistance $\Delta R_1 = R_1 - R_{01}$, where R_{01} is the electrical resistance of an ideal lattice at T_1 and R is the equilibrium value of the electrical resistance at T_1 .

$$\Delta R = \Delta R_1 [1 - \exp(-t/\tau_r)].$$

Orig. art. has: 7 figures and 4 equations.

SUB CODE: 20// SUBM DATE: 07Dec64

Card. 3/3

L 42149-05

ENT (S) / (M) / (P) / (L) / (T) / (K)

137 (S) 30/01/86/0000

ACC NR: AP6028581

SOURCE CODE: UR/0129/66/000/008/0002/0006

AUTHOR: Bokshteyn, S. Z.; Giunashvili, D. A.; Gudkova, T. I.; Kishkin, S. T.

ORG: none

TITLE: Vaporization and pore formation in aluminum-zinc and copper-zinc alloys

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 8, 1966, 2-6

TOPIC TAGS: aluminum ^{base} alloy, copper ^{base} alloy, ~~alloy~~ vacuum sublimation, ~~metal~~ porosity / IL68 copper ^{base} alloy, V92 aluminum base alloy

ABSTRACT: Vaporization and pore formation in L68 brass (Zn—32%; Cu—68%), and V92 (Fe—0.15%; Mn—0.61%; Si—0.11%; Mo—4.18%; Zn—3.20%) and A (Zn—9.10%) aluminum-base alloys have been investigated at temperatures up to about 700C in a vacuum of 10^{-3} — 10^{-6} torr. It was found that in copper-zinc alloy, the pores form in the whole volume of specimens, while in aluminum-base alloys, the pores form on the surface by vaporization of grain portions and even whole grains. The rate of vaporization and pore formation was affected by stresses

Card 1/2

UDC: 669.7135:539.378.3

ACC NR: AP6028581

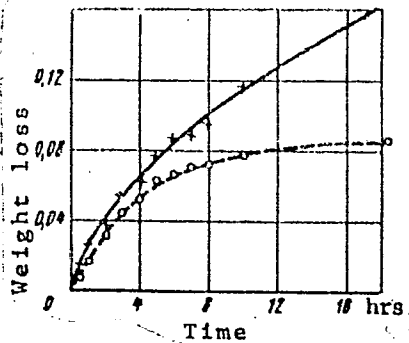


Fig. 1. Time dependence of weight loss at 750C for unstressed specimen (broken line) and a specimen under tension of 15 kg/mm² (solid line)

(see Fig. 1). The weight loss of an aluminum-alloy specimen under a tensile stress of 0.3 kg/mm² in 20 hr at 500C was six times greater than that of an unstressed specimen. However, at 550C the effect of stresses on the vaporization rate was negligible. It was also established that in aluminum alloys, the pores form around structure defects, mainly at the grain boundaries. Therefore, electrolytically polished specimens vaporized more slowly and formed fewer pores than conventionally polished specimens. Tensile stress intensifies pore formation at the grain boundaries. In the subsequent stages, diffusion determines the rate of vaporization and pore formation. The amount of pores and the rate of their formation increases with a temperature increase; however, after the pores are

formed, no significant increase in their size and number was observed with prolonged exposure time. With increasing zinc content, the amount of evaporated zinc and the number and depth of pores increase rapidly. Orig. art. has: 2 figures and 3 tables. SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 005/ OTH REF: 004/ ATD PRESS: 5063

L 07382-67 EWT(m)/EWP(t)/ETI LJP(c) JD/JG

ACC NR: AP6027751

(N)

SOURCE CODE: UR/0370/66/000/004/0139/0142

AUTHOR: Bokshteyn, S. Z. (Moscow); Kishkin, S. T. (Moscow); Moroz, L. M. (Moscow);
Chaplygina, V. S. (Moscow)

ORG: None

TITLE: Characteristics of carbon diffusion in niobium

SOURCE: AN SSSR. Izvestiya. Metally, no. 4, 1966, 139-142

TOPIC TAGS: carbon, niobium, metal diffusion

ABSTRACT: The nature of carbon diffusion in niobium is studied as a function of structure and surface state. The specimens were melted in a vacuum arc furnace, forged and heat treated at 2000°C for 10 hours to produce a uniform structure and relieve internal stresses. Carbon diffusion was studied by autoradiography combined with microstructural analysis. The niobium specimens were diffusion saturated with radioactive carbon at 900°C for 2 hours. Three types of carbon diffusion measurement in the surface layer were compared: 1. directly after stabilizing annealing in a vacuum at 2000°C for 10 hours; 2. after stabilizing annealing and mechanical destruction of the surface layer by polishing the specimens on glass with abrasive powders of varying granularity and by preparation of a microsection; 3. in the oxidized surface of a microsection. It was found that considerable diffusion of carbon takes place along the

Card 1/2

UDC: 548.526

L 07382-67

ACC NR: AP6027751

0

grain boundaries of the niobium regardless of the state of the surface layer. The surface state has a considerable effect on volumetric diffusion. Annealed specimens show practically no volumetric diffusion while specimens with a polished surface show considerable mobility of carbon atoms within the niobium grains. This diffusion is considerably stronger along the subgrain boundaries than in the remainder of the grain volume. Analysis of the experimental results shows that carbon diffusion in niobium consists of three elementary processes: 1. diffusion of carbon in the crystal lattice of niobium; 2. reactive diffusion with the formation of a carbide phase; 3. diffusion of carbon in niobium carbides. The carbide phase is formed chiefly in defect sections of the structure: along the boundaries of grains and subgrains and also in the less perfect sections of the grain volume where diffusion is most intense. Orig. art. has: 1 table.

SUB CODE: ^{11,07/}~~20~~ SUBM DATE: 09Mar65/ ORIG REF: 006/ OTH REF: 005

Card 2/2 LS

ACC NR: AP7006207

(A)

SOURCE CODE: UR/0363/67/003/001/0157/0166

AUTHOR: Bokshteyn, S. Z.; Kishkin, S. T.; Svetlov, I. L.

ORG: none

TITLE: High strength and the problem of filamentary crystals

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 3, no. 1, 1967, 157-166

TOPIC TAGS: construction material, sapphire, crystal, elastic modulus, fiber, whisker

ABSTRACT: The paper discusses the possibility of increasing the specific strength of construction materials by reinforcing them with filamentary crystals. Compositions based on such crystals possess a favorable combination of high strength and adequate plasticity. Fillers used in such compositions may be filamentary crystals of brittle nonmetallic compounds having a high elastic modulus, a high melting point, and a low density. One of the most promising fillers are sapphire whiskers. A theoretical analysis of the mechanism of reinforcement of a composition reinforced with discrete fibers is given, and the nature of the failure of such materials is discussed as a function of the length of the reinforcing fiber. Orig. art. has: 5 figures, 4 tables and 4 formulas.

SUB CODE: 11/ SUBM DATE: 27Apr65/ ORIG REF: 003/ OTH REF: 012

Card 1/1

UDC: 548:539.4

EXCERPTA MEDICA Dec.11 Vol.10/10 Oto-Rhino-Laryngo Oct57

BOKSHEYN Ya. S.

1888. BOKSHEYN Ya. S. Moscow. *Indirect injury of the external ear in cases of traumas of the maxilla (Russian text) VESTN. OTO-RINO-LARING. 1957, 3 (65-68)

The author observed 2 patients with injuries of the cartilaginous and osseous portions of the external auditory canal caused by trauma of the mandible with subsequent haemorrhage of the ears. Such a clinical picture may mislead the surgeon to a diagnosis of a fracture of the base of the skull. The author describes the clinical picture and mechanism of such a trauma in two patients.

PRIOROV, N.N., prof., red.; KASAVINA, B.S., doktor biolog.nauk, red.;
BOKSHTEYN, Ya.S., red.

[Biochemical changes in the body following injury; transactions of a conference of workers of the biochemical laboratories of the institutes of traumatology and orthopedics] Biokhimicheskie izmeneniia v organizme pri travme; trudy. Pod obshchei red. N.N. Priorova i B.S.Kasavinoi. Moskva, Tsentral'nyi in-t travmatologii i ortopedii, 1959. 243 p. (MIRA 14:3)

1. Konferentsiya nauchnykh rabotnikov biokhimicheskikh laboratoriy institutov travmatologii i ortopedii. 1956. 2. Deystvitel'nyy chlen AMN SSSR (for Priorov). (WOUNDS AND INJURIES) (METABOLISM)

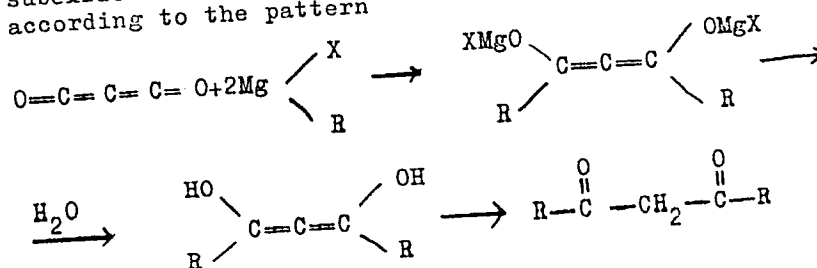
BOKSHEYN, Ya.S., doktor med.nauk

Disorders of vocal function following electric shock. Vest.otorin.
no.6:93-95 '61. (MIRA 15:1)

1. Iz Tsentral'nogo instituta travmatologii i ortopedii Ministerstva
zdravookhraneniya SSSR (dir. - deystvitel'nyy chlen AMN SSSR
prof. N.N. Priorov [deceased]), Moskva.
(ELECTRICITY, INJURIES FROM) (LARYNX--DISEASES)

AUTHORS: Dashkevich, L. B., Boksiner, Ye. I. SOV/79-28-10-47/60
 TITLE: Organomagnesium Synthesis by Means of Carbon Suboxide I.
 (Magniyorganicheskiy sintez s pomoshch'yu nedokisi ugleroda I.)
 PERIODICAL: Zhurnal obshchey khimii, 1958, Vol 28, Nr 10,
 pp 2845 - 2846 (USSR)

ABSTRACT: As carbon suboxide is a peculiar ketene and in many reactions behaves like a ketene, it was to be expected that the organomagnesium synthesis by means of carbon suboxide should yield the symmetric β -diketones, according to the pattern



Card 1/2

Organomagnesium Synthesis by Means of Carbon Suboxide I. SOV/79-28-10-47/60

This assumption of the authors was confirmed: By means of carbon suboxide, diacetyl-, dipropionyl-, divaleryl-, dibenzoyl- and di-(phenyl-aceto)-methane could be synthesized. The yields of β -diketones varied rather widely (from 15 to 70%). It was thus demonstrated that in the reaction of carbon suboxide with organomagnesium compounds at low temperatures and in an ether medium, symmetric aliphatic and aromatic β -diketones are formed. It seems that in individual cases this reaction can be employed as a method for the synthesis of the symmetric β -diketones. There are 5 references, 1 of which is Soviet.

ASSOCIATION: Leningradskiy khimiko-farmatsevticheskiy institut (Leningrad Chemopharmaceutical Institute)

SUBMITTED: September 24, 1957
Card 2/2

BOKSTEYN, I.S.; KHITROV, F.M.

Method of surgical treatment of atresia of the hypopharynx.
Vest. otorinol. no. 5:68-70 Sept-Oct 1950. (CJML 20:1)

1. Of the Maxillary-Facial Division (Head -- Prof. N. M. Mikhel'son), Central Institute of Traumatology and Orthopedics of the Ministry of Public Health USSR (Director -- Honored Worker in Science Prof. N. N. Priorov), Moscow.

YUGOSLAVIA/Chemical Technology. Chemical Products and Their
Application. Ceramics. Glass. Binding Materials.
Concrete.

Abs Jour: Ref Zhur-Kham., No 10, 1959, 35664.

Author : Dokszczanin, S., Ferlan, M., Kotnik, S., Lindner, M.,
Ozim, V., Sonnenwald, S.

Inst : Slovene Chemical Society

Title : Yugoslav Corundum Production.

Orig Pub: Vestnik Slov Kem Drustva, 4, No 1-2, 55-58 (1957) (in
Slovene with an English summary)

Abstract: Geological and chemical prospecting has led to
the discovery of a deposit of bauxites suitable for
the production of corundum. A plant constructed at
the site is now furnishing all of Yugoslavia's abra-
sives demand. -- From a summary by the authors.

Card : 1/1

H-39

BOKTI'KO, N.M., inzh.

Possibilities of winning peat for fuel in the Far North. Zbor.st.
po izuch.torf.fonda no.2:235-244 '57. (MIRA 11:8)

1.Nar'yan-Maruskaya sel'skokhozyaystvennaya opytnaya stantsiya
Instituta sel'skogo khozyaystva Kraynego Severa.
(Russia, Northern--Peat)

BCKUCHAVA, G.^V, Georgian Polytechnical Inst. im S. M. Kirov "Ursachen des Schleifschreibenverbrauchs und Massnahmen zur Erhöhung der Standzeit."
Der Maschinenbau, 6 June 1957.

BOKUCHAVA, G. V. Cand Tech Sci -- (diss) "Mechanism of the wear-and-tear of grinding wheels." Tbilisi, 1958. 14 pp with illustrations (Min of Higher Education USSR. Georgian Polytechnic Inst im S. M. Kirov), 150 copies (KL, 52-58, 101)

PHASE I BOOK EXPLOITATION

80V/3569

Bokuchava, Givi Vladimirovich

Shlifovaniye metallov s podachey okhlazhdayushchey zhidkosti skvoz' shlifoval'nyy krug (Grinding of Metals With Coolant Fed Through the Grinding Wheel)
Moscow, Mashgiz, 1959. 106 p. 5,000 copies printed.

Reviewer: Ya.I. Tokarev, Engineer; Ed. of Publishing House: R.D. Beyzel'man, Engineer; Tech. Ed.: G.Ye. Sorokina; Managing Ed. for Literature on Metalworking and Tool Making (Mashgiz): R.D. Beyzel'man.

PURPOSE: The book is intended for technical personnel of machine-building plants.

COVERAGE: The book deals with methods of feeding coolants through the pores of grinding wheels. Designs of cooling arrangements and the results of comparative tests of ordinary coolant feed and feed through the grinding wheel are presented. The advantages of through feed and suggestions for its introduction into practice are discussed. The mechanism of wheel wear is treated, and practical recommendations are made for the selection of the correct technical specifications for a given grinding wheel and for a given thickness of wheel surface to be removed during truing. No personalities are mentioned. There are 82 references:

Card 1/3

Grinding of Metals (Cont.)

SOV/3569

66 Soviet, 7 English, 7 German, 1 French, and 1 Czech.

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Grinding of Metals (Cont.)

SOV/3569

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Ch. IV. Mechanism of Grinding-Wheel Wear

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AVAILABLE: Library of Congress

Card 3/3

VK/mas
6-30-60

BOKUCHAVA, G.V., aspirant

Hardness of heated abrasive materials. Izv.vys.ucheb.zav.;
mashinostr. no.5:184-187 '59. (MIRA 13:4)

1. Gruzinskiy politekhnicheskii institut im. S.M.Kirova.
(Abrasives--Testing)

ANDREYEV, G.S., kand. tekhn. nauk; BOKUCHAVA, G.V., kand. tekhn. nauk, dots.; BRAKMAN, L.A., inzh.; BUDNIKOVA, A.V., inzh.; GORDON, M.B., kand. tekhn. nauk, dots.; ZHAVORONKOV, V.N., inzh.; KARZHAVINA, T.V., kand. tekhn. nauk; KOROTKOVA, V.G., inzh.; KORCHAK, S.N., inzh.; KLUSHIN, M.I., kand. tekhn. nauk, dots.; KUZNETSOV, A.P., kand. tekhn. nauk, dots.; KURAKIN, A.V., inzh.; LATYSHEV, V.N., inzh.; OL'KHOVSKIY, V.N., inzh.; ORLOV, B.M., kand. tekhn. nauk, dots.; OSHER, R.N., inzh.; PODGORKOV, V.V., inzh.; ; SIL'VESTROV, V.D., kand. tekhn. nauk [deceased]; TIKHONOV, V.M., inzh.; TROITSKAYA, D.N., inzh.; KHRUL'KOV, V.A., inzh.; LESNICHENKO, I.I., red. izd-va; SOKOLOVA, T.F., tekhn. red.; GORDEYEVA, L.P., tekhn. red.

[Lubricating and cooling fluids and their use in cutting metals]
Smazochno-okhlazhdaiushchie zhidkosti pri rezanii metallov i
tekhnika ikh primeneniia. Moskva, Gos. nauchno-tekhn. izd-vo
mashinostroit. lit-ry, 1961. 291 p. (MIRA 15:1)
(Metalworking lubricants)

BOKUCHAVA, G.V., kand.tekhn.nauk

Cutting temperature in grinding. Vest.mashinostr. 43 no.11:62-66 N
'63. (MIRA 17:2)

S/137/62/000/CO7/045/072
A057/A101

AUTHORS: Gongadze, D. N., Bokuchava, I. T.

TITLE: On recrystallization of solid nickel-manganese solutions

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 7, 1962, 43, abstract 71245
("Tr. Gruz. politekhn. in-t", 1961, no. 6 (77), 123 - 129;
Georgian summary)

TEXT: Alloys of electrolytic Ni and Mn, containing 0 - 25.6% wt. Mn smelted in a high-frequency furnace under flux, were forged at 1,000°C and homogenized by annealing at 900°C during 10 hrs. Microstructures of the alloys were investigated, and microhardness, electric resistance and the lattice constant were measured. Diagrams of the dependence of these characteristics upon the concentration are presented. The alloys with 3.6, 17.8 and 25.6% Mn were rolled into strips of a thickness of 0.025 - 0.035 mm (shrinkage 98%), tempered in salt baths at temperature up to 650°C with holding times 10, 20, 30 and 60 min. and quenched in water. The microhardness was measured and the process of recrystallization investigated by X-ray analysis. The temperatures of the beginning and

Card 1/2

On recrystallization of...

S/137/62/000/007/045/072
A057/A101

end of recrystallization were determined, as well as the activation energy Q of recrystallization. The dependence of the value of Q upon the concentration is discussed in connection with the change in the surface energy of crystallites and forces of interatomic bonds and the formation of distortions in the Ni lattice when alloyed with Mn, as well as in connection with phase transitions in the Ni-Mn system.

A. Babareko

[Abstracter's note: Complete translation]

Card 2/2

ACCESSION NR: AR4035563

S/0271/64/000/003/B010/B010

SOURCE: Ref. zh. Avtomat., telemekh. i vy*chisl. tekhn. Av. t. , Abs. 3B50

AUTHOR: Bokuchava, I. T.; Chavchanidze, V. V.; Kumsishvili, V. A.

TITLE: Stochastic-logical generation of digital aggregates

CITED SOURCE: Tr. In-ta kibernetiki. AN GruzSSR, v. 1, 1963, 25-35

TOPIC TAGS: stochastic process, stochastic process generation, Markov chain generation, stochastic logical generation

TRANSLATION: Generation of stochastic processes, particularly, of a simple homogeneous Markov's chain with a discrete time by means of functions of the algebra of logic is considered. Four generator types developing one and n symbols per unit of time are presented. For each generator, probabilities of p_{ij} - transitions from the i-th state to the j-th state are calculated; the maximum probabilities R_i of the transitions are needed for estimating the process entropy. It is proven that by selecting suitable values of probability of using various logical functions, random processes with the required p_{ij} and R_i can be obtained, i. e., the stochastic process can be controlled in a certain sense. An example is

Cord1/2

ACCESSION NR: AR4035563

given. Bibliography: 5 titles.

DATE ACQ: 17Apr64

SUB CODE: MA

ENCL: 00

Card 2/2

BOKUCHAVA, K. D.

Academy of Architecture USSR.

BOKUCHAVA, K. D.: "Progressive lines in the architecture of popular housing in eastern Georgia (on examples of the cities of Telavi and Signakhi in the 19th and 20th centuries)." Academy of Architecture USSR. Moscow, 1956.

(Dissertation for the Degree of Candidate in Architectural Sciences)

SO: Knizhnaya Letopis', No. 20, 1956

GONGADZE, D.N.; BOKUCHAVA, I.T.

Recrystallization of solid solutions nickel - manganese. Trudy
GPI [Gruz.] no.6:123-129 '61. (MIRA 16:4)
(Nickel-manganese alloys) (Crystallization)

ERISTAVI, D.I.; BOKUCHAVA, L.V.

Study of organic matter in mineral waters of Georgia. Soob.
AN Gruz. SSR 39 no.2:299-304 Ag '65. (MIRA 18:9)

1. Gruzinskiy politekhnicheskii institut imeni Lenina. 2. Chlen-
korrespondent AN GruzSSR (for Eristavi).

PRISTAVI, D.I.; BOKUCHAVA, I.V.

Organic matter in the mineral waters of Borzhomi. Biol.
MOIP Otd. geol. 40 no. 6:123-127 Nov '65
(MIRA 19:1)

PROCESS AND PROPERTIES INDEX																																																																													
<p>4</p> <p>Insoluble form of tea tannin. M. A. Bokuchava and V. R. Popov. <i>Doklady</i> 10, 234 (1945). The bound form of tannin in tea leaves is linked to proteins. Alkali ruptures the link; the tannin can then be extd. A purified form of this tannin is pptd. thus: Tea leaves which had been thoroughly washed to remove sol. tannins are treated with alkali in an atm. of N₂. The ext. is exactly neutralized with acid, in the absence of O₂, and extd. several times with ethyl acetate. The tannin is pptd. from the concd. ext. with CHCl₃, yield 3%. H. Priestley.</p> <p>27</p>																																																																													
ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION																																																																													
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120

Separation of tea tannins into fractions. M. A. Diky-chava and A. M. Belikov. *Biokhimiya Cheloveka* Proc. Acad. Sci. No. 5, 15-24 (1940).—Tea tannins were sep'd. into fractions: pptd. by $(NH_4)_2SO_4$ and extractable by Et_2O , pptd. by $(NH_4)_2SO_4$ and extractable by $EtOAc$, not pptd. by $(NH_4)_2SO_4$ but extractable with Et_2O , not pptd. by $(NH_4)_2SO_4$ but extractable by $EtOAc$, polyphenols, and tannin. The pH values of the fractions, resp., are: 5.42, 4.51, 4.83, 5.29, 5.42, and 5.57. The fractions are still mixts. The fractions not pptd. with inorg. salt are very rich in pyrocatechol tannins (83%), the precipitable fractions contain only 50-60%; a similar relationship exists in the phloroglucinol content. Blue $FeCl_3$ color is formed by all except the unprecipitable fraction extractable with $EtOAc$ which gives green color. Na_2SO_4 gives pinkish color with all except the above fraction which gives a bright orange color. Alk. $Pb(OAc)_2$ soln. gives pink colors with nonprecipitable $EtOAc$ -sol. fraction, precipitable and extractable by Et_2O fraction, and with polyphenols-catechols; others give yellow shades. Tea tannin not pptd. by salt and sol. in Et_2O or $EtOAc$ is not pptd. by caffeine; all other types are pptd. G. M. Kosolapoff

CA

11D

Determination of water-insoluble tannin. M. A. Boku-
chava and V. R. Popov. *Biokhimiya Chaiu* (Proceed-
ings; Zhurnal No. 5, 32-40, 1946) (English summary); cf.
C.I. 39, 5327. — Tea prepd. from Indian, Chinese, and
Japanese tea plants contains 7.2-7.7% of a protein-bound
form of tannin which is "insol." in water. It can be readily
desorbed by treatment with 1% hot NaOH, preferably in a
vacuum, in a hermetically sealed app. which is described.
The filtered ext. is titrated with KMnO_4 as usual.

G. M. Kosolapoff

CA

12

Technology of crystalline tea. M. A. Bokuchava and K. M. Dzhenukhadze. *Riokhimiya Chaiogo* (Proceedings of the All-Union Symposium on Tea, 1960). A summary of the experience of production of "crystalline" tea. The process developed at the Biochem. Institute (A. N. Bakh) in 1941, consists of mech. working, drying, hot aq. extn., filtration, concn. of ext., drying, and tableting. Teas from Georgian S.S.R. contain 25-60% tannins in products from high grades of tea, and about 24% when made from cheaper grades. High-grade products contain 22-35% sol. N compds., 0-7% caffeine, and 32-4% carbohydrates and pectins. In poorer grades the former 2 classes are lower and the latter is correspondingly higher. Both black and green products are made, which are possessed of good taste and flavor qualities. Usual tableting (final step) is made with added sugar in various amts., such as 0.15-0.25 g. tea per 5-6 g. sugar for sweet variety commonly used in the locale. (I. M. Kosolapoff)

CA

12

A stimulating beverage from tea leaves. K. M. Dzh.
mukhadze and M. A. Bokuchava. *Biokhimiya Chelno*
Proizvodstva *Sovetsk* *Sci.* *101* 3 (English summary)
(1940). Tea-leaf matter is extd. with aq. EtOH, prefer-
ably cognac alc., by using 10-20 parts alc. per 1 part tea-
leaf. The product contains (av.) EtOH 40-2%, caffeine
28-70 mg. per 100 ml., tannins 300-800 mg. per 100 ml., and
vitamin C 3.4-14 mg. %. The extn. is best of 0-7 hrs.
duration.
G. M. Kosolapoff

CA

12

Chemical evaluation of black teas. M. A. Bokuchava, I. A. Egorov, V. R. Popov, and A. M. Belikov. *Khimiya Chaiaga Proizvodstva Sbornik* No 3, 170-88 (English summary) (1940).—Exams. of teas of various grades showed that the hemicellulose content correlates best of all with quality; generally hemicellulose content shows inverse trend compared to tannin content. The ratio tannin to hemicellulose is a convenient index. High-quality India tea gives the index of 2.6; low-quality China tea gives but 0.60. G. M. Kosolapoff

CA

Taste qualities of various fractions of tea tannin and their significance in tea quality. M. A. Bokuchava and N. P. Novozhilov. *Biokhimiya Chaynogo Przemysla Sbornik* No. 5, 190-6 (English summary) (1946).—Tannin fractions (cf. preceding abstr.) have definite effects on tea quality. The fraction not pptd. by $(\text{NH}_4)_2\text{SO}_4$ and extractable by Et_2O has the most pronounced effect on the most important taste and aroma qualities of tea; the EtOAc -extractable fraction is next in importance. The precipitable tannin gives some evidence of bitter taste. Tannin extd. according to Kursanov (*C.A.* 35, 7468⁴) gives some pos. taste qualities, while polyphenol-catechol fraction gives a "fruitiness" taste to the tea. G. M. Kosolapoff

CA

12

Comparison of some forms of tannins in Georgian and foreign teas. M. A. Bokuchava. *Biokhimiya Chai'nogo Proizvodstva* No. 3, 197-201 (English summary, 201-2) (1946).—Various grades of Georgian (U.S.S.R.), Indian, and Chinese tea were examd. as to content of the various tannin fractions (cf. 2nd preceding abstr.). Georgian teas compare very closely in tannin compn. with Indian teas, both having high 76-9% pyrocatechol tannins in the fraction that is not pptd. by $(NH_4)_2SO_4$. The Chinese tea has about 43% of this tannin; hence its flavor is sweeter. Similarly the color of the brewed tea is again similar for Georgian and Indian teas, although no significant differences are found among all 3 types on the transmission curves; in acidified solutions the Georgian and Indian teas show closer color similarity to each other than to Chinese tea. G. M. K.

CHANGES AND PROPERTIES DURING PROCESSING AND PROPERTIES DURING PROCESSING

Changes of different fractions of tanning substances in the tea leaf during growth and processing. M. A. Bokuchava (Acad. Sci., Moscow). *Biokhimiya* 11, 243-71 (1946).-- During the growth of the tea leaf the amt. of free polyphenols and catechols decreases, whereas the combined forms increase. Polyphenoloxidase activity is slight in old leaves, which are poorly fermentable. The polyphenol-catechol fraction in the tea leaf disappears during processing. Real tannin is thereby formed, which imparts the taste to the tea. H. Priestley

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1ST AND 2ND ORDERS																										PROCESSES AND PROPERTIES INDEX																									
<p>CA</p> <p>Enzymic oxidation of different fractions of tea tannins M. A. Bokuchava (Bach-Buchem. Inst., Moscow). <i>Dokl. Akad. Nauk SSSR</i> 12, 58-60 (1947); cf. C.I. 40, 65714. While the tannins in the tea leaf represent 90% of all the reducing substances, the ether-sol. fraction (polyphenols and catechols) is not subject to autooxidation by the O of the air, at a pH 5.3, but is energetically oxidized in the presence of the enzyme polyphenoloxidase. On the other hand, the tea tannin itself (ethyl acetate fraction) is subject to autooxidation; that is, it is easily oxidized by the O of the air. The tea tannin is also oxidized in the presence of polyphenoloxidase, with the formation of dark brown products. Tannin is formed in an oxidative manner. The building blocks are the tannin substances of low mol. wt., polyphenols and catechols. H. Priestley</p> <p>117</p>																																																			
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BOKUCHAVA, M. A.

PA 64T23

USSR/Chemistry - Tea
Chemistry - Enzymes

Jan/Feb 1948

"Oxidizing Ferments of Tea Leaves," M. A. Bokuchava,
T. A. Shubert, V. R. Popov, Inst of Biochem imeni
A. N. Bakh, Acad Sci USSR, Moscow, 8 pp

"Biokhim" Vol XIII, No 1

Object was to study more closely the soluble and un-
soluble forms of tea leaf ferments, and to determine
the possibility of their replacement conversion and
their relation to various substrata. Submitted
27 May 1947.

64T23

BOKUCHAVA, M. A.

PA 3/49T79

USSR/Medicine - Oxidase and Peroxidase Mar/Apr 48
Medicine - Enzymes

"The Role of Polyphenoloxidase and Peroxidase
in the Conversion of Tannic Substances of Tea,"
M. A. Bokuchava, Biochem Inst imeni A. N. Bach,
Acad Sci USSR, Moscow, 5 1/2 pp

"Biokhimiya" Vol XIII, No 2

Reports laboratory experiments. Concludes that
polyphenoloxidase causes oxidation of tannic
substances, accompanied by absorption of
oxygen, decrease in tannin content, and formation
of tea infusion. Peroxidase causes still greater
decrease in tannin, accompanied by considerable
3/49T79

USSR/Medicine - Oxidase and Peroxidase Mar/Apr 48
(Contd)

condensation, expressed as further decrease in
free phloroglucine, and formation of high-
molecular soluble and insoluble tannin; this
is not accompanied by parallel formation of
pigment, consequently peroxidase does not play
an appreciable part in formation of tea infusion.
Submitted 14 Aug 47.

3/49T79

1ST AND 2ND ORDERS										3RD AND 4TH ORDERS									
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<div style="position: relative;"> <div style="position: absolute; top: 10px; left: 10px; font-size: 2em; font-weight: bold;">CA</div> <div style="position: absolute; top: 10px; right: 10px; font-size: 1.5em;">112</div> <div style="position: absolute; top: 200px; left: 300px; width: 60%; text-align: justify;"> <p>The role of polyphenoloxidases and peroxidases in the transformation of tea tannins. M. A. Babichava (Bach Biochem. Inst., Moscow). <i>Biohimiya</i> 19, 173-4(1948); cf. C.A. 41, 48306.—In the earlier work on tea tannins, peroxidases were considered as the most important oxidizing agents. In the newer investigations, the oxidizing role is assigned to polyphenoloxidases, and the peroxidases are ignored. It has been found that polyphenoloxidases are responsible for the oxidation of tea tannins, which is accompanied by the absorption of O and a decrease in the tannin content. Under the influence of the peroxidases, the loss of tannins is much greater. Condensation reactions take place, with a decrease of free phenolglucosid and the formation of high mol. wt. and insol. tannins. Peroxidases play no role in the formation of colored substances, which are produced solely by the polyphenoloxidases. H. Priestley</p> </div> </div>																			
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<div style="display: flex; justify-content: space-between;"> CA 11 B </div> <p>New method for the determination of peroxidase in the presence of polyphenoloxidase and catalase. M. A. Bolshakova (Bach Biochem. Inst., Moscow). <i>Biokhimiya</i> 13, 360-3 (1948); cf. <i>C.A.</i> 42, 7841f; <i>Biokhimiya</i> 13, 42 (1948).—The peroxidase detn. is carried out in a special vacuum app., where, in the absence of O, the polyphenol-oxidase cannot interfere. The catalase activity is inhibited by the addn. of NaNO₂. H. Priestley</p>																																													
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BOKUCHAVA, M. A.

PA-77T8

USSR/Chemistry - Peroxidases . .
Chemistry - Catalases

Apr 1948

"A New Method for the Study of Peroxidase in the Presence of Polyphenoloxidase and Catalase," M. A. Bokuchava, Inst Biochem imeni A. N. Bakh, Acad Sci USSR, 4 pp

"Dok Ak Nauk SSSR" Vol LX, No 3

By old method at times was impossible to differentiate between peroxides and polyphenoloxidases since both formed in similar manner. New method permits determination of presence of peroxides even in presence of polyphenoloxidase and catalase. Submitted by Acad A. I. Oparin 27 Feb 1948.

77T8

1ST AND 2ND ORDERS																																																																													
PROCESSING AND PROPERTY INDEX																																																																													
<p>The role of peroxidase and polyphenoloxidase in tea fermentation. M. A. Bukuchaya and V. P. Popov. <i>Doklady Akad. Nauk. S.S.S.R.</i> 60, 619-23(1948).—Ground tea leaves were treated with H_2O_2 with exclusion of atm. O to exclude the polyphenoloxidase system activity; this permits only the peroxidase to function; this does not yield a leaf with the typical odor and color even in 60 hrs.; the leaf remains green. Leaving the samples in air (polyphenoloxidase action) gave the typical fermented tea leaf in 3-4 hrs. Gross tannins of the tea leaf treated with the peroxidase system only do not form colored products but their $KMnO_4$ titer drops (52.8%; time not stated); conversely polyphenoloxidase leads to red-brown color formation and a much smaller titer drop (35%). Dialysis of the products under comparable conditions through cellophane shows an increase of undialyzable (high-mol.-wt.) fraction to: 50.4% for polyphenoloxidase action, 41.1% for peroxidase-H_2O_2 action with initial value of 10.8%. Phloroglucinol, initially 36 γ, drops to 19 γ after polyphenoloxidase system action, and to 13.5 γ after the action of the peroxidase system. Such profound changes in the tannin are probably significant in the development of taste.</p> <p style="text-align: right;">G. M. Kosolapoff</p>																																																																													
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Bokuchava, M. A.

Doc Biolog Sci

Dissertation: "Tannins and Oxidation Enzymes of Georgian Tea."

13 May 49

Inst of Biochemistry Imeni A.N. Bakh, Acad Sci USSR

SO Vecheryaya Moskva
Sum 71

1ST AND 2ND ORDERS										PROCESSES AND PROPERTIES INDEX										3RD AND 4TH ORDERS									
<div style="position: absolute; top: 10%; left: 10%; font-size: 2em;">BC</div> <div style="position: absolute; top: 10%; right: 10%; font-size: 2em;">010 3</div> <div style="position: absolute; top: 40%; left: 30%; border: 1px solid black; padding: 5px;"> <p>2937. New method of estimating peroxidase activity in presence of polyphenol esters and esters. M. A. Ilkuchava. <i>(Biochim. USSR, 1949, 22, 222; Food Sci. Abstr., 1951, 22, 222)</i>.—The estimations are made in a modified Tinsberg tube in which reactions occur in a vac. Interference by polyphenol oxidase is thus prevented by absence of O₂. Catalyst is furnished by NaNO₂. The activity of peroxidase under these conditions was estimated in tea leaves, horse radish, potatoes, and cabbage and in the skins of lemon, mandarin, and orange.</p> <p style="text-align: right;">R. B. CLARKE.</p> </div>										<div style="position: absolute; top: 10%; right: 10%; font-size: 2em;">010 3</div>																			
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CA

The nature and significance of tannins in the tea leaf.
M. A. Bokuchava. *Biochimica Chelago Preimolitus*
Shvets, No. 6, 30-34 (1950).—In the tea-leaf tannins the
following empirical formulas were deduced for the various
fractions: crude tannins $C_{11}H_{10}O_6$; polyphenol-catechols
 $C_{11}H_{10}O_6$; tannins proper $C_{11}H_{10}O_6$; finished tea (Georgian)
contains tannins (unsepd. crude) with compn. $C_{11}H_{10}O_6$.
Direct vacuum distn. readily yielded pyrogallol from unox-
phous tannins from young tea leaves. Polyphenol-catechol
fractions of the tannins are not spontaneously oxidized by
atm. O, but tannin fraction is oxidized rapidly, while mixed
with polyphenol-catechol fraction its oxidation is almost
halted, indicating the antioxidant action of the former.
Tea tannins can act as H acceptors in biol. oxidation-reduc-
tion systems (expts. with ascorbic acid are cited), and can
be regarded as respiratory chromogens. The sol. pigments
which det. the quality of tea beverage are products of en-
zymic oxidation of tannins of the green leaf; the insol. pig-
ments coned. during brewing of black tea are also oxidation
products of tannic matter. G. M. Kozlapoff

CA

HD

Basic principles of study of oxidative enzymes of tea.
M. A. Bokuchava and T. A. Shubert. *Biokhimiya Chai'nogo
Proizvodstva*, No. 6, 90-96 (1950). Oxidative en-
zymes in tea leaf are largely in the bound form, very little
enzyme matter being in the unbound, free state. Their
detn. in aq. solns. gives an erroneous estm. of actual content
of enzymes in the leaf. By means of extn. with Me₂C₂O₄ one
obtains exts. contg. all polyphenoloxidase and peroxidase of
the leaf and such exts. are most convenient for enzyme stud-
ies since they are tannin-free, as well as free of chlorophyll
and other masking substances. A sep. detn. of peroxidase
in anaerobic conditions in the presence of polyphenoloxidase
was developed. The specimen in a dry vacuum vessel (a
vertical test-tube with 2 rotatable side vessels like those in
modified Warburg flasks) is mixed with NaNO₂ soln. to
give a 1M soln. of the inhibitor; 3 ml. buffer (pH 5.3) and 5
ml. H₂O are added, the lower side vessel is charged with 2
ml. substrate (1% pyrogallol, catechol, tea tannin, etc.)
and 2 ml. 1% H₂O₂, while the upper vessel carries 3 ml. 20%
H₂SO₄. After evacuation and degassing at 8-10 mm. the
pump is disconnected and the substrate is added to the test
specimen. The action is stopped at the end of the run by
the addn. of the H₂SO₄ soln. Colored oxidation products
from action of peroxidase are then detd. as usual by colorim-
etry. G. M. Kosolapoff

CA

Changes in tannic substances under the action of polyphenoloxidase and peroxidase. M. A. Boguchaya. *Bio-khimiya Chai'nogo P'rozvodstva, Sbornik No. 6, 100 (1950).* Oxidative enzymes of the tea leaf convert its tannins into colored products and colorless condensation products. Polyphenoloxidase causes oxidation in which O is absorbed and colored pigments form that characterize the color of brewed tea. Peroxidase-H₂O₂ oxidize tea tannins largely in terms of formation of higher condensation products without formation of color. In terms of tea fermentation, peroxidase does not play a part in the prepn. of tea exts., or has at most a minor role since its activity is limited by peroxides present and by the action of catalase. Hence fermentation processes are due to polyphenoloxidase system. G. M. Kosolapoff

CA

12

Changes in tannins during production of green brick tea.
 M. A. Bokuchava, V. R. Popov, and R. K. Petrova. *Bio-
 khimiya Chaiuogo Proizvodstva* Sbornik No. 6, 163-9 (1950).
 The tannins of the rough tea leaf (the grade used for brick tea
 production) suffer changes during production of green brick
 tea. Water-sol. tannins decline, largely at the expense of
 polyphenolcatechol fraction with simultaneous rise of tannin
 proper and of the bound forms of tannic substances. Dur-
 ing the roasting process the active oxidative enzymes are in-
 activated, that of polyphenoloxidase being irreversible,
 that of peroxidase being temporary as some of its activity is
 reestablished in later steps of production. The fungi which
 are prominent during the production process definitely
 show activity of the polyphenoloxidase type which causes
 oxidation of tea tannins with absorption of atin. O. Prepn.
 of an aq. ext. of brick tea is connected with oxidation of
 tannins and proceeds via fermentation caused by the micro-
 floral polyphenoloxidase activity. Since prolonged action
 of elevated temp. (50-60°) alters the tannin compn. a fac-
 tory control of this factor is important. G. M. K.

CA

The role of tannins in oxidation-reduction processes in plants. M. A. Bokuchava, V. R. Popov, and T. A. Shubert. *Doklady Akad. Nauk S.S.S.R.* 76, 439-42 (1951).--Expts. with ascorbic acid and purified samples of polyphenolcatechins and tannins from tea leaves (using an acetone prep. of tea polyphenoloxidase) showed that at 25° and pH 5.3, no oxidation of ascorbic acid occurs unless

the tannins are present. Until ascorbic acid is oxidized, no pigment formation or loss of titer of the tannins takes place. Addn. of ascorbic acid to powd. tea leaves leads to a delayed increase of O absorption if the leaf fermentation processes are still proceeding. (I. M. Kosolapoff

BOKUCHAVA, M. A. and SOCHAVA, V. B.

"Some Data on the Growth of Tea Plants and the Quality of Tea Leaves
under the Forest Cover," Dokl. AN SSSR, 85, No.5, 1952

BOKUCHAVA, M.A., doktor biologicheskikh nauk.

Biochemistry of tea. Priroda 42 no.11:90-95 N '53.

(MLBA 6:11)

1. Institut biokhimii im. A.N.Bakha Akademii nauk SSSR.

(Tea)

BOKUCHAVA, M.A.; POPOV, V.R.; SIDOROV, V.S.

Chromatographic separation of free aminoacids in fresh and wilted
tea leaves. Dokl.AN SSSR 95 no.3:609-610 Mr '54. (MLRA 7:3)

1. Institut biokhimii im. A.N.Bakha Akademii nauk SSSR.
Predstavleno akademikom A.I.Oparinym.
(Amino acids) (Tea) (Chromatographic analysis)

USSR/ Chemistry - Biochemistry

Card 1/1 : Pub. 22 - 33/47

Authors : Bokuchava, M. A., and Porov, V. R.

Title : Importance of amino-acids in the formation of tea aroma during their reaction with tannic acid at higher temperature

Periodical : Dok. Ak. SSSR 99/1, 145-148, Nov 1, 1954

Abstract : The role and value of amino-acids in the development of tea aroma during their reaction with tannic acid at higher temperatures are explained. Seven USSR references (1927-1952). Tables.

Institution : Academy of Sciences USSR, The A. N. Bakh Institute of Biochemistry

Presented by : Academician A. I. Oparin, August 21, 1954

Med Vitamin P activity in various kinds of tea. M. A. Boku-
chava, V. N. Bekin, N. N. Erofeeva, and V. R. Popov
(A. N. Bakh Blochem. Inst., Moscow). Doklady Akad.
Nauk S.S.S.R. 111, 162-4(1958).--Expts. with feeding of
white rats with aq. exts. of different kinds of tea showed that
green tea has the highest vitamin P activity (tested by time

of appearance of perichial hemorrhages after vacuum test
on the skin) followed by black, yellow, and red varieties of
tea. Caffeine per se does not show vitamin P activity.

G. M. Koschepoff

AUTHOR
TITLE

20-2-46/62
BOKUCHAVA, M.A., SKOBELEVA, N.I., DMITRIYEV, A.F.,

Biochemical Changes in the Aromatic and Gustatory Substances, and the Quality of Tea.

(Biokhimicheskiye izmeneniya aromaticeskikh i vkusovykh veshchestv i kachestvo chaya -Russian)

PERIODICAL

Doklady Akad.Nauk SSSR, 1957, Vol 115, Nr 2, pp 362-363 (U.S.S.R.)

ABSTRACT

It is generally known that during the drying of tea at ca. 85-95°C a loss in aroma takes place. According to investigations, about 75-80% of the essential oils formed during fermentation escape on that occasion. In order to retain these latter and to obtain an aromatic tea, the present work on lyophilic drying was done. Tab.1 shows that light-brown tea obtained from such a drying kiln possesses an intensive aroma, identical with that of fermented tea. Thus the lyophilic kiln-drying makes it possible to retain the aroma of the tea. Only little of volatile aldehydes is lost. The organoleptic analysis of this tea showed, however, that its aroma, in spite of its intensity, is not the aroma of black tea. The sample of lyophilically dried tea is quite dissimilar to black tea in its taste. It has the grassy, unpalatable taste of a raw leave. Additional drying at high temperature also gives the samples neither the color nor the aroma or other properties of black tea. These tests confirm the data earlier obtained by the authors on the formation of aroma during the heat-treatment of the tea leave. All this indicates the great importance of elevated temperatures for the formation of the quality of

Card 1/2

BIOCHEMICAL CHANGES IN THE ALKALOIDS AND TANNINS OF TEA - 20-2-70/02
stances, and the quality of Tea.

black tea. During drying at high temperature the necessary transformations in the chemical composition of the leave take place. As a consequence develop the properties of tea which we like: taste, aroma and color. Thus the kiln-drying at elevated temperature is a necessary and irreplaceable stage of operation. Simultaneously with the removal of moisture thermochemical processes take place under the influence of this high temperature which cause the formation of aromatic and gustatory substances. At this temperature the essential oils of the tea leave undergo certain transformations, indispensable for quality, which lead to the formation of the characteristic aroma of black tea. In the case investigated here the formation of essential oils of another qualitative composition takes place.
(2 tables, 6 Slavic references).

... INSTITUTION Institut biokhimii im. A.N. Bakha Akademii nauk SSSR

PRESENTED BY OPARIN A.I., Member of the Academy, April 19, 1957

SUBMITTED

AVAILABLE Library of Congress. April 18, 1957

Card 2/2

BOKUCHAVA, M.A.; SKORNIKOVA, N.I.

Studying the aromatic aldehydes of tea [with summary in English].
Biokhimiia 22 no.3:561-564 My-Je '57. (MIRA 10:11)

1. Institut biokhimii im. A.N.Bakha Akademii nauk SSSR, Moskva.
(TEA) (ALDEHYDES)

BOKUCHAVA, M.A.; SKOBELEVA, N.I.

Role and significance of aldehydes in tannic conversions at high temperature [with summary in English]. Biokhimiia 22 no.6:1004-1007 N-D '57. (MIRA 11:2)

1. Institut biokhimii im. A.N.Bakha Akademii nauk SSSR, Moskva.

(TANNIN

aldehydes in tannic conversion prod. in high temperature (Rus))

(ALDEHYDES,

in tannic conversion prod. in high temperature (Rus))

BOKUCHAVA, M.A.; SKOBELEVA, N.I.

Study of volatile aldehydes of the tea plant. Dokl. AN SSSR 112
no.5:896-898 P '57. (MLBA 10:4)

1. Institut biokhimii im. A.M. Bakha Akademii nauk SSSR. Pred-
stavleno akademikom A.I. Oparinym.
(Tea) (Aldehydes)

AUTHORS: Bokuchava, M. A., Popov, V. R.

20-114-6-40/54

TITLE: Transformations of Nitrogenous Substances During the Thermal Treatment of Tea (Prevrashcheniya azotistyykh veshchestv pri termicheskoy obrabotke chaya).

PERIODICAL: Doklady AN SSSR, 1957, Vol. 114, Nr 6, pp. 1284-1286 (USSR)

ABSTRACT: In earlier papers (references 1-3) the authors proved the participation of amino acids in the formation of aldehydes which are of importance for the aroma of tea. In the present work the authors investigated the influence of the thermal treatment upon the substances mentioned in the title. For this purpose they analyzed tea samples which had been subjected to this treatment and samples (as control) which stemmed from a hitherto valid technological process. The total nitrogen as well as the soluble protein- and nonprotein-nitrogen (table 1) were determined by means of the micro-method (reference 4). From this may be seen that the test- and control-samples only insignificantly differ from each other with regard to the fractions of the soluble protein- and nonprotein-nitrogen. The influence of the thermal treatment upon the amount of free amino acids was chromatographically investigated on paper. They were

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Transformations of Nitrogenous Substances During the Thermal Treatment of Tea 20-114-6-40/54

extracted with 80% ethyl alcohol. In the test- as well as in the control-samples the authors determined: lysine, histidine and arginine, serine, aspartic acid, glutamic acid, alanine, "theanine", "valine", phenylalanine and leucine. No marked difference in the amount of free amino acids between tea with and without thermal treatment can be seen from the chromatograms (figure 1). Furthermore the free amino acids were quantitatively determined from the individual dyed and cut out strips of the chromatogram. They were washed out with 50% methyl alcohol and the liquid was then colorimetrically determined. From the data of table 2 follows that the heat-treatment influences the transformation of free amino acids in this respect that the content of some of them (serine, glutamic acid, phenylalanine and leucine) increases. This indicates that in the thermal treatment the oxidative processes do not go as far as in an ordinary fermentation. This is also indicated by the comparison of a not fully fermented tea with a tea that fermented for 5-6 hours (table 3). The not fully fermented tea differs from the latter by a higher content of histidine and arginine, serine,

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phenylalanine and leucines. In an oxidative decarboxylation it is just these amino acids which yield pleasantly smelling aldehydes which influence the aroma of tea (reference 5). This apparently explains the fact that the thermal treatment of the tea-leaves is most effective when not fully fermented tea is used as initial material. There are 3 tables, and 5 references, all of which are Slavic.

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